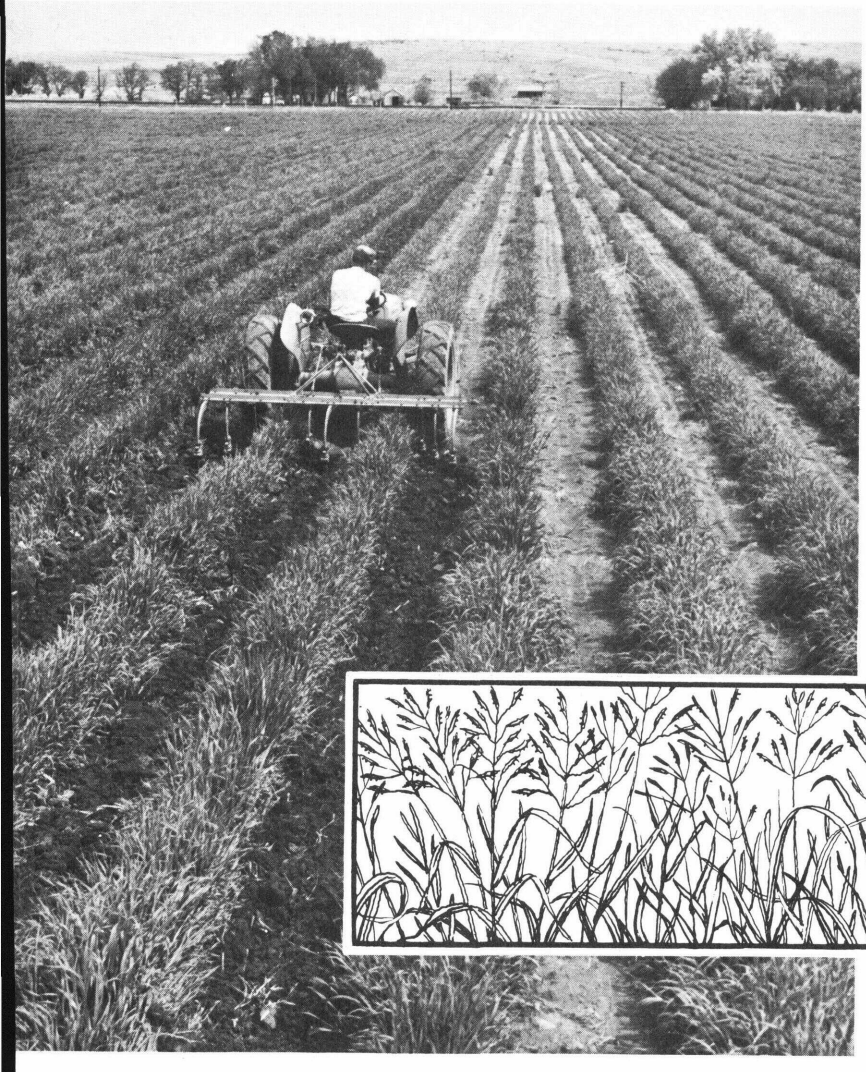
Producing and Harvesting Grass Seed in the Great Plains



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UNITED STATES DEPARTMENT OF AGRICULTURE

Producing, harvesting, and processing grass seed are not simple operations. They require as much skill as similar steps in managing cereal and other farm crops. In particular, careful attention should be given to (1) selecting areas suitable for producing seed, (2) determining seed fill, (3) selecting and adjusting harvesting equipment, and (4) timing harvesting operations. Experience in each of these often means the difference between success and failure in producing seed.

This bulletin will help farmers, ranchers, and technicians choose the native and introduced grasses best suited for a specific purpose. It gives characteristics of some of the grasses and the best methods of producing, harvesting, and cleaning the seed.

This bulletin covers the 10 Great Plains States—Montana, Wyoming, Colorado, New Mexico, Texas, Oklahoma, Kansas, Nebraska, South Dakota, and North Dakota. Because of low and irregular rainfall, grass has a greater part in agriculture here than elsewhere in the United States.

Farmers' Bulletin 1985, Seed for Regrassing Great Plains Areas, is superseded by this bulletin.

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PRODUCING AND HARVESTING GRASS SEED IN THE GREAT PLAINS

By H. W. Cooper, James E. Smith, Jr., and M. D. Atkins, *plant materials technicians, Soil Conservation Service*

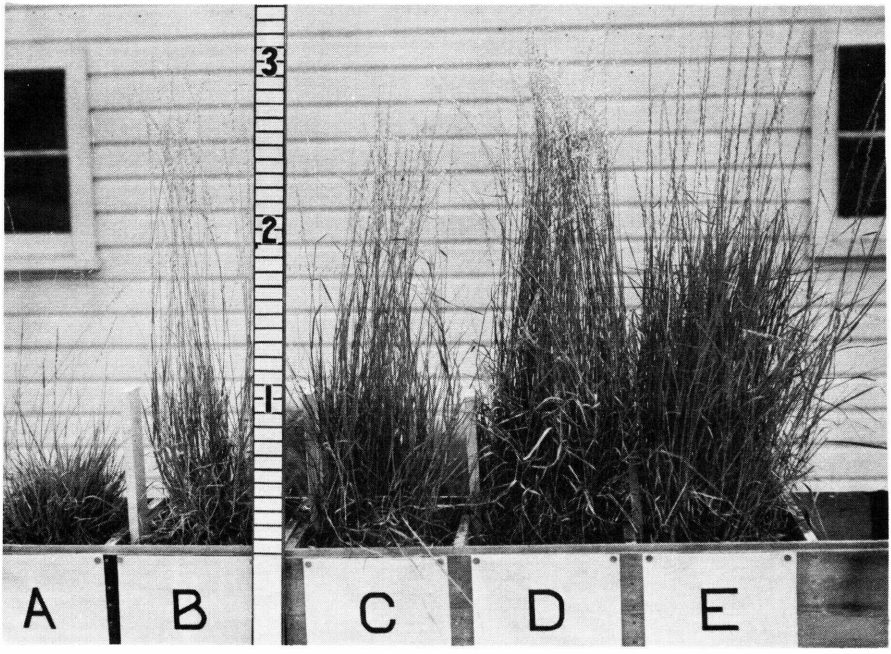
More and more farmers and ranchers are finding it pays to harvest grass seed from their own land. Market supplies of native grass seed are still inadequate. And because of unpredictable weather, they vary greatly from year to year.

Experience shows that producing grass seed under cultivation is both practical and profitable and is the only way to produce adequate and dependable supplies.

Demand for seed is certain to grow as more low-producing cropland is seeded permanently to grass and as grasses are used more in the regular cropping systems on farms and ranches.

Grass in Conservation Farming

Probably no crops grown in the United States have more conservation uses or more all-around value than the grasses. Wherever they are grown, grasses protect land from wind and water erosion and improve soil structure. In addition, they produce pasture and hay. As a result, more acres are being seeded to grass and more species of grass are being grown in the United States now than ever before.



KAN–888

Figure 1.—Side-oats grama collections from the following locations in the Great Plains, grown at Manhattan, Kans.: *A,* Mandan, N. Dak.; *B,* Lincoln, Nebr.; *C,* McPherson, Kans.; *D,* Chickasha, Okla.; and *E,* San Antonio, Tex.

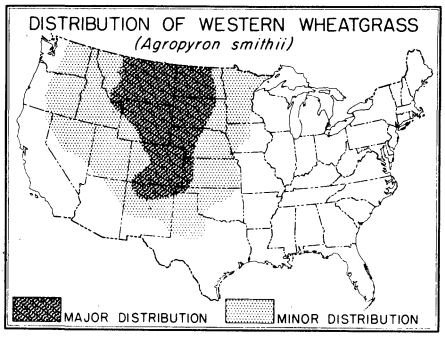
Grasses are being seeded to restore badly eroded land to useful production, to restore depleted rangeland, to heal gullies, to prevent damage by runoff water on steep slopes, and to line waterways so that excess water from cultivated fields can be disposed of without erosion.

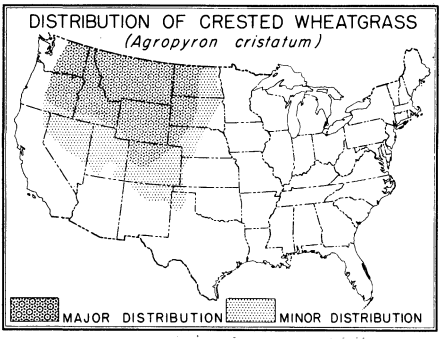
Choosing Your Grass Seed

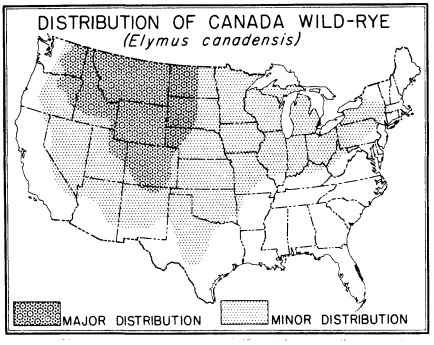
As a group, the native and several of the introduced forage grasses of the Great Plains are adapted to wide ranges of soil and climate (see center pages).

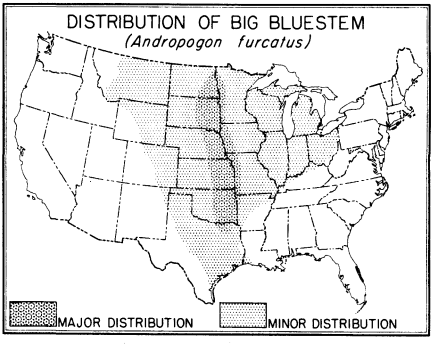
For each of the principal grasses adapted to the Great Plains, areas of major and minor distribution are shown in maps. Chances of producing grass seed are good within the minor-distribution area, but better within the major-distribution area.

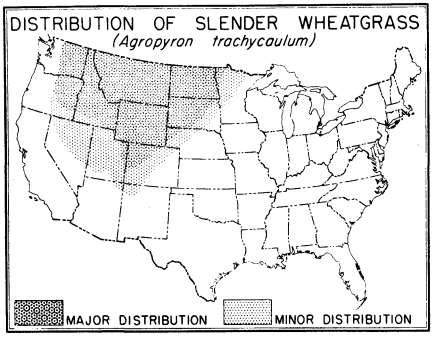
Individual grasses, however, have different needs. Some require highly fertile soil. Some are adapted to low-rainfall conditions; others require lots

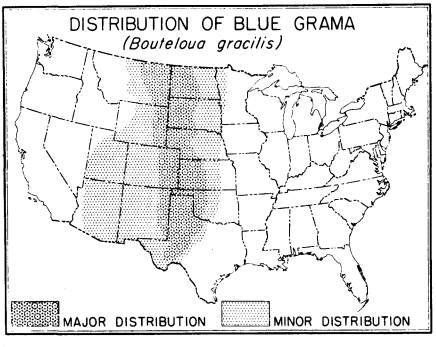


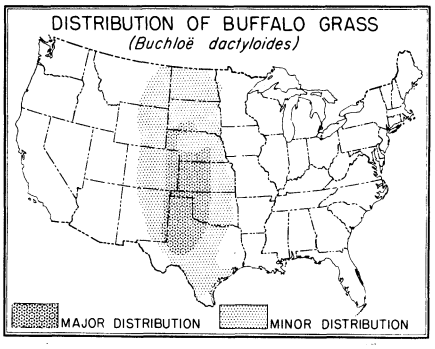


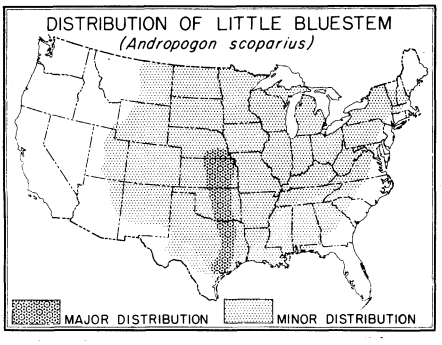


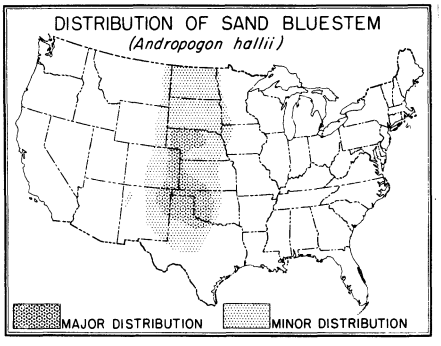












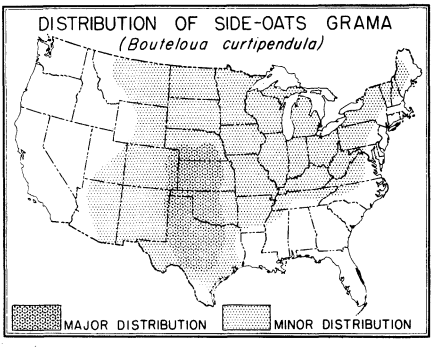
of moisture. Some, such as tall wheatgrass, are especially well suited for planting in alkaline soils.

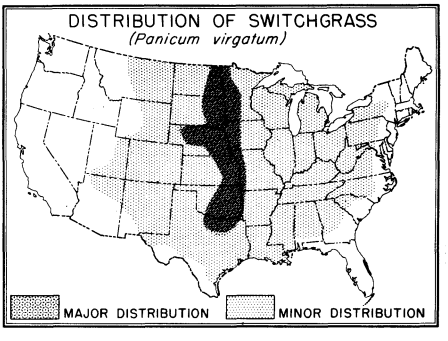
Species and strains of native grasses brought from the northern to the southern Great Plains are usually unsuited to southern conditions (fig. 1). And some of those suited to the southern Plains cannot stand the cold of the northern Plains. Cool-season grasses are most abundant in the northern Plains and the warm-season grasses in the southern Plains. However, each may be important for special uses throughout the Great Plains.

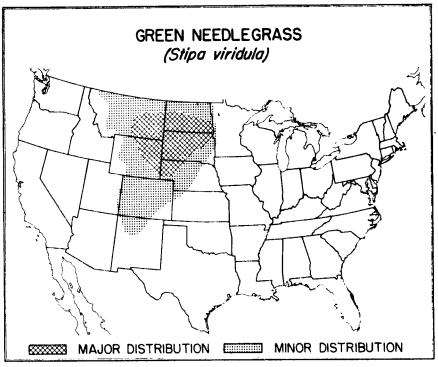
In general, when choosing seed of native grasses, choose seed originating not more than 150 to 200 miles north or 250 to 300 miles south of where you intend to use them. Better yet, unless you can get seed of proved varieties, use seeds of local origin.

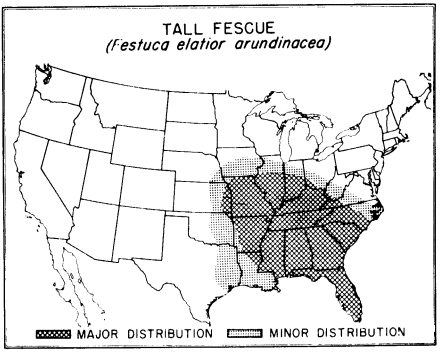
State agricultural experiment stations, the Soil Conservation Service, and other agencies have carried on cooperative trial plantings to test suitability of certain species and strains under specific field conditions. Results of these trials serve to guide the farmer in choosing the right grasses for conservation planting.

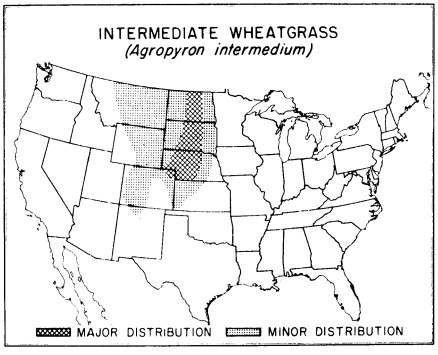
For example, smooth brome was introduced in the Great Plains from both Russia and Hungary. The Nebraska Agricultural Experiment Station in cooperation with the Agricultural Reseach Service found that test plantings of Russian strains did not produce well and did not thrive during

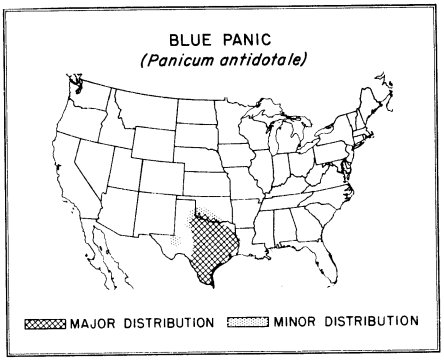


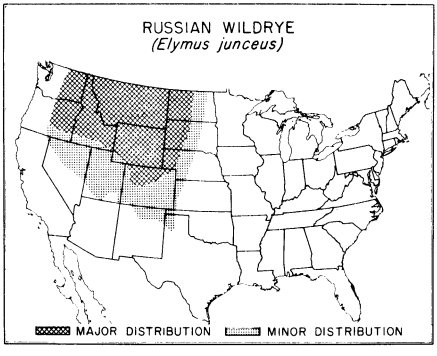


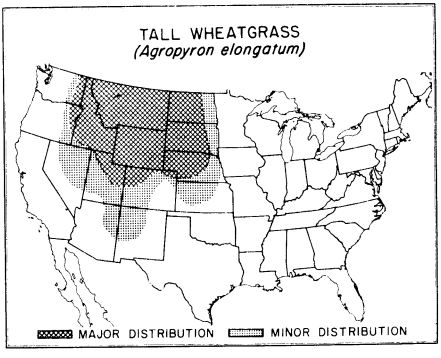


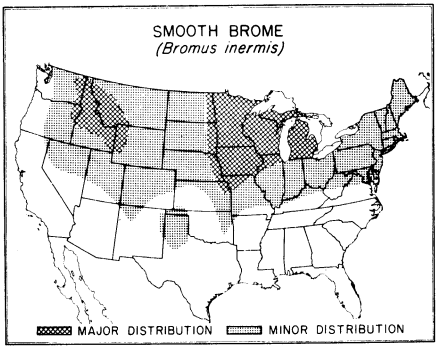












the long, dry, hot summers. But Hungarian strains also planted in Nebraska produced vigorous plants that thrived during the summer. In the northern Plains, the Russian strains were as well adapted as the Hungarian strains.

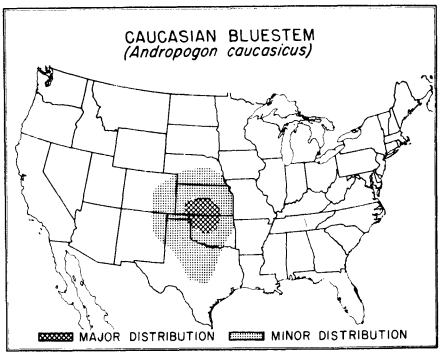
Blue grama grows naturally from North Dakota to central Texas. Within this range, blue grama seed from widely scattered locations was planted to determine forage yield and adaptation to soils and climate. Blue

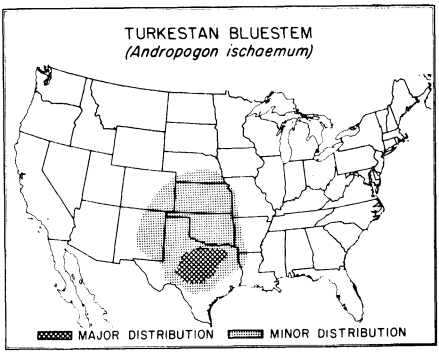
grama seed from Texas planted in North Dakota continued to grow during cool fall weather but did not set seed before killing frost. Also, many of the plants could not stand the low winter temperatures of North Dakota. Blue grama seed from North Dakota grown in central Texas bloomed and set seed early in the summer but produced little forage and no new growth for the rest of the season.

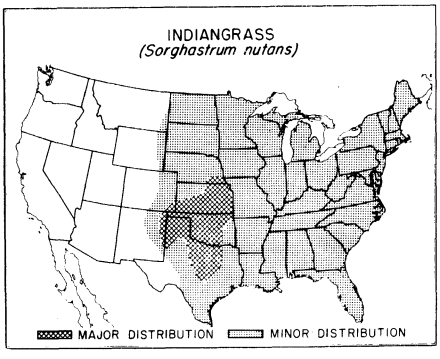
Producing Grass Seed

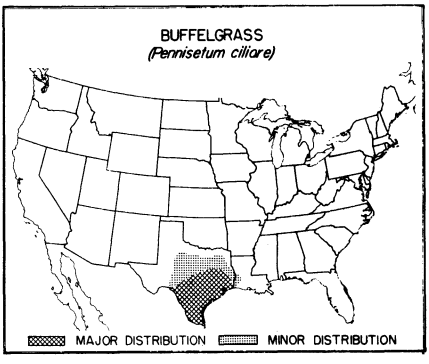
Experience shows that only by producing grass seed under cultivation—preferably under irrigation—can adequate and dependable supplies become available (fig. 2). Only when seed supplies are assured can you make sound plans for planting grass in ranges, pastures, waterways, and crop rotations. This is because over most of the Great Plains, you must make plans for seeding grass a year ahead to get the correct seedbed preparation.

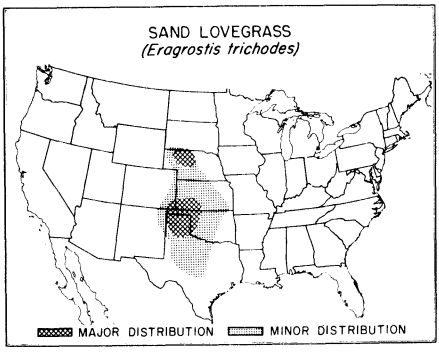
Most native grass seed for seeding in

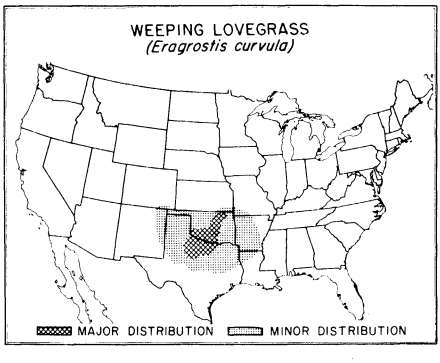


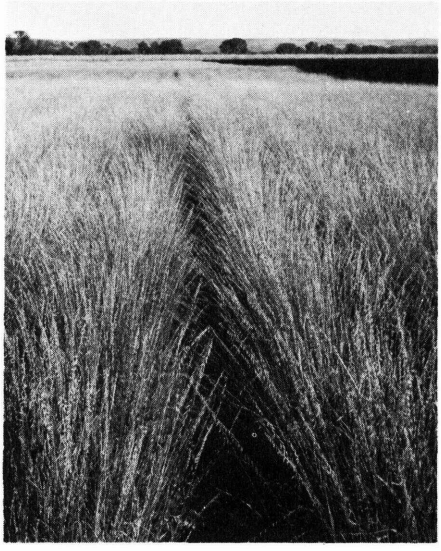












KAN–979

Figure 2.—**El Reno side-oats grama grown in rows and intertilled for seed production.**

the Great Plains has come from harvests on native grassland. Good seed crops usually develop in native stands when favorable moisture is coupled with light or no grazing. Blue grama and western wheatgrass seed has generally come from this source (fig. 3). Most of the buffalograss, side-oats grama, and bluestem seed has come from pure or mixed native grass stands. Though such harvests have been important, they are not a dependable source of seed year after year.

Without irrigation, producing grass seed under cultivation is profitable only under certain conditions. To be fairly certain of a profitable seed crop 6 or 7 years out of 10, you need 30 inches or more annual rainfall for most grasses in the southern Great Plains and 18 inches or more in the northern.

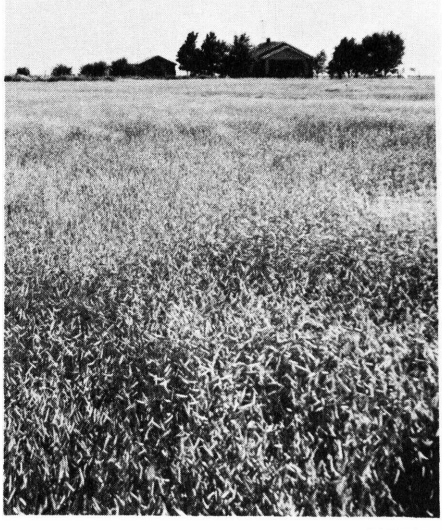
Cash returns from seed sale are not the only value of this sort of planting. The grass roots improve soil structure and also raise the water-holding capacity of the soil and the rate of water intake. And forage yields are usually high regardless of whether seed is produced. Because of this, you may find it best to plant grass primarily for seed production but use forage yields to stabilize your annual income from the field.

Climatic hazards that make seed production uncertain on dry land (without irrigation) increase sharply toward the western part of the Plains. But it is here that you have the most favorable conditions for seed production under irrigation.

Grasses grown under irrigation produce maximum yields of seed and forage and can be counted on to do this year after year under good management.

Preparing the Seedbed

The field you select for grass-seed production should be free of perennial weeds or other plants that might reduce yields, interfere with cultivation and harvesting, or contaminate your seed crop. Medium-textured soils are ideal because they are easiest to work. But you can produce seed from the grasses considered here in soils ranging from sandy to clayey texture.



NM–2527

Figure 3.—**This thick, native stand of blue grama on a New Mexico range shows the density needed for a good seed yield.**

Two kinds of seedbeds are suitable—(1) clean, freshly tilled ground or (2) stubble from a previous crop grown in close-drilled (6- to 10-inch) rows. A stubble seedbed free from weeds or volunteer crops is best because the land is as firm as it can be made without packing. Also, the stubble and litter on the ground reduce or eliminate crusting, rapid surface evaporation, and wind and water erosion and give light shade for the seedlings while they are small. For the southern Great Plains, sudan or a similar forage sorghum serves best as the close-drilled stubble crop. In the north, small-grain stubble may be used if it is almost free from volunteer growth or excessive weeds. Small-grain stubble is most often used for fall grass seedings. Seeding is done in the stubble cover without any tillage at seeding time (fig. 4).

Use a clean-tilled seedbed only where stubble is not available and then only in the northern Plains or intermountain valleys. If you use a clean seedbed, be sure the surface is smooth and firm before you plant. Fall plowing is preferred over spring plowing. You may need to roll the land with a land packer before seeding to get the right firmness for successful seedling establishment.

Planting Date and Row Spacing

Cool-season grasses are usually planted in the fall or just as soon as conditions permit fieldwork in the spring. Warm-season grasses usually should be spring planted. In the extreme south where winters are mild, warm-season grasses are planted in either the spring or early fall. Check with your local soil conservation district, Soil Conservation Service technician, or county agent for the best planting dates.

Plant grass for seed production in rows from 36 to 42 inches apart. Usually you can use the same row spacing you use for your other cultivated crops. Thus, you can move your equipment from one field to another without adjustment. With a

TEX–45,438

Figure 4.—**Planting grass into a sudangrass-stubble seedbed with a special grass drill. Drill has seed boxes for planting all types of grass seed. It has double disk-furrow openers with planting-depth control bands.**

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few grasses a closer row spacing may be used. Blue grama, for example, may produce top seed yields when grown under irrigation in rows as close together as 10 to 12 inches. In this case, you would do little or no cultivation and let the density of the stand control weed growth after the first season.

Use the same row-crop cultivating equipment for grass grown for seed production that you use for other row crops (fig. 5). You can get special equipment commercially that may do a better job under some conditions, but you do not need this equipment to grow grass seed successfully. Cultivate frequently enough to control weeds and keep the grass in rows.

Where broad-leaf weeds predominate or are a problem in the row, you can usually control them with 2,4–D. To avoid damaging the grass, wait till the grass seedlings have 5 or 6 leaves before you apply the spray.

NEB–1826

Figure 5.—**Cultivating Lincoln bromegrass for seed production near Hitchcock, Nebr.**

Planting Rate

It is false economy to use low seeding rates in establishing grass for seed production. Thin stands permit excessive weeds in the rows, and the weeds may persist for a long time. The ideal stand is thick enough in the seedling stage to crowd all weeds out of the row by the end of the first growing season. Seed from such stands is higher in purity and nearly always better in quality than seed from weedy stands. Get local recommendations for the exact rate of seeding for the kind or quality of seed you use. Generally, use a heavier seeding rate (about 50 percent higher) on irrigated land than on nonirrigated land.

Irrigating

Different crops have different water needs, but here are some general rules for irrigating grass for seed production:

1. Your irrigation system should be designed so as to permit even distribution of water. Uneven application results in uneven ripening of the grass seed and adds to your harvesting problem.

2. Apply enough water 60 to 90 days before seed maturity to bring the water content of the soil to near field capacity to a depth of about 3 feet.

3. Once you start irrigating, repeat often enough for continuous plant growth. The frequency and amount of water required will vary. They depend on the seasons' temperatures, rainfall, and wind and on the soil and kind of grass.

4. The grass plants must have ample water at the start of the flowering period. But, apply little or no water after seed reaches the soft-dough stage. Irrigation after this promotes lodging and uneven ripening.

5. Give cool-season grasses a full irrigation in the late fall.

6. You may be able to fit grass-seed production into a cropping program even where your water supply is limited and the water must be used on other crops early in the season. Blue grama, for example, can be left without irrigation in the southern Great Plains until late summer, then fertilized and watered regularly thereafter until the seed crop forms. The

seed matures in late September or early October.

7. Grasses are generally more efficient users of water than most field crops, and 20 to 25 inches of water applied per season usually produces satisfactory seed yields.

8. Use a steel rod as a probe, or a soil auger or spade, to check water penetration at each irrigation. Normally a field is adequately irrigated when the ground is wet 2 feet deep.

9. If you need to irrigate for stand establishment, keep the soil surface moist by frequent light irrigations until seedlings have emerged. Irrigate thereafter only frequently enough to keep a steady growth rate.

Fertilizing

Grass needs fertilizer for best growth and seed production. Soil tests from the field and local experience will help you decide whether to use a complete fertilizer. Grass, particularly under irrigation, is a heavy user of nitrogen. Even with soil tests, you should determine by trial the maximum amount of single-element or mixed fertilizer that will produce the highest yields at a profit (fig. 6).

The most effective rates and time of application vary throughout the Great Plains. They are different for cool-season and warm-season grasses and for irrigated and nonirrigated stands. As a general guide, plan to start annual applications of fertilizer at the beginning of the first growing season. Apply the fertilizer at about the time the grass begins growth in the spring. The cool-season grasses will start growth 4 to 8 weeks earlier than warm-season ones. Occasionally, fall applications of fertilizer may be used to advantage.

Without irrigation, apply a minimum of 30 pounds of nitrogen per acre. Heavier applications are often profitable.

With irrigation, apply a minimum of 40 pounds of nitrogen per acre per crop for grasses that produce more than one seed crop a year. Make the first application at the time spring growth starts and the second after the first seed crop is harvested. For grasses that produce only one seed crop a year, apply a minimum of 60 pounds of nitrogen per acre. Heavier applications are often required to maintain production as the stands become older.

If you have a fertilizer-placement drill, 10 to 15 pounds of nitrogen per acre placed directly below the row of seed helps insure establishment. You can also broadcast the nitrogen or use it as a sidedressing at seeding time. This usually, however, increases competition from annual weeds and grasses.

On established stands of grass, apply fertilizer about 2 inches deep in narrow bands 4 to 6 inches from each side of the row. Broadcasting the fertilizer on the ground surface with a spreader is effective where grasses have formed a complete turf or where you have no weeds between the rows.

TEX–49,474

Figure 6.—**A 3-year-old planting of buffelgrass showing the effect of fertilizer (left) and of no fertilizer (right).**

Managing Grass Residue

Keep as much of the grass residue as you can in the soil near the surface. After seed harvest of most of the tall native warm-season grasses and many of the introduced warm-season ones grown under irrigation, you will have 4 tons or more of aftermath left in the field. Make some provision for removing the excess residue you cannot return to the soil.

This excess makes grass-seed production fit well into a livestock enterprise. You can use it for grazing or cut it for roughage. This roughage is often high in feeding value.

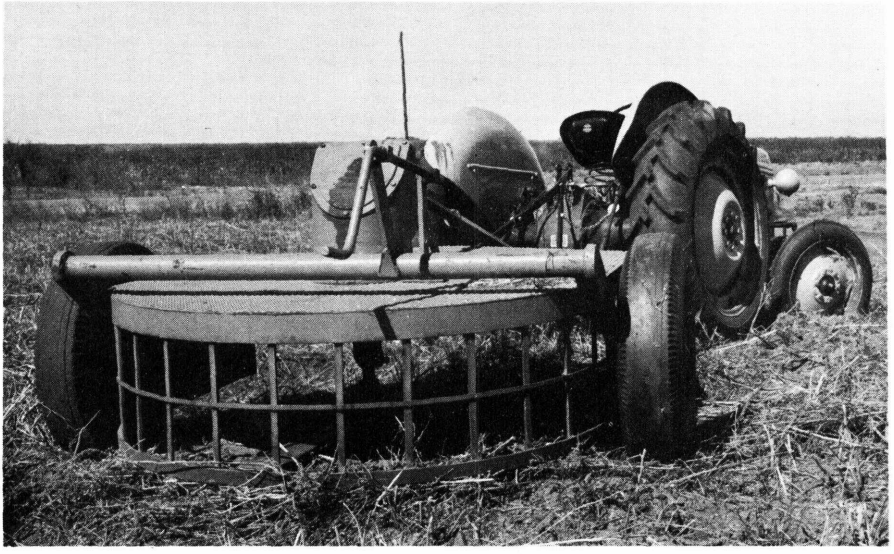
Mow grass-seed fields back to about 4 inches above the ground surface at the start of the growing season and after harvest of each seed crop during the growing season except after the fall one. Leave the forage growth remaining after the fall seed crop to catch and hold drifting snow or to give winter and early spring grazing.

A rotary shredder does an excellent job of cutting back the uneaten stems to the right height at the beginning of the growing season (fig. 7). This shredder is effective whether you return all or only part of the crop residue to the soil. The shredded material is easier to work into the soil than material with long stems or leaves.

Cultivators with disk gangs or modified rotary hoes are satisfactory for working the shredded material into the soil (fig. 8). Add about 25 pounds of nitrogen per ton of plant material returned to the soil. If you do not add nitrogen at this time, some of the nitrogen for new plant growth will be tied up in decomposing straw.

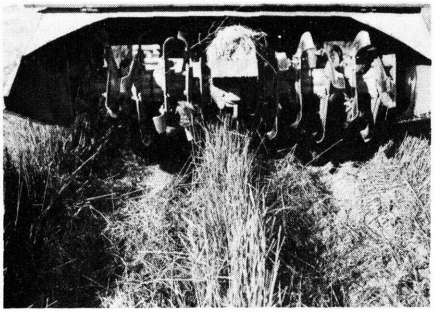
Controlling Insects

Insects such as thrip, grasshoppers, red spider, and lygus bugs often cause serious damage. Sometimes such insects are not apparent until too late for treatment. Examine your grass-seed fields frequently. If you find harmful insects, use an insecticide immediately. Insecticides used for this purpose include toxaphene, dieldrin, aldrin, and chloradane. Follow local recommendations as to the best insecticide and when and how to apply it for controlling specific insect pests.



TEX–47,337

Figure 7.—**Rotocycle stalk cutter or shredder chops seed stalks after harvest; cultivators work this residue into the soil.**



NM–13,227

Figure 8.—**Using a rototiller to intertill tall wheatgrass, break up straw, and work residue into the soil.**

Planting Machinery

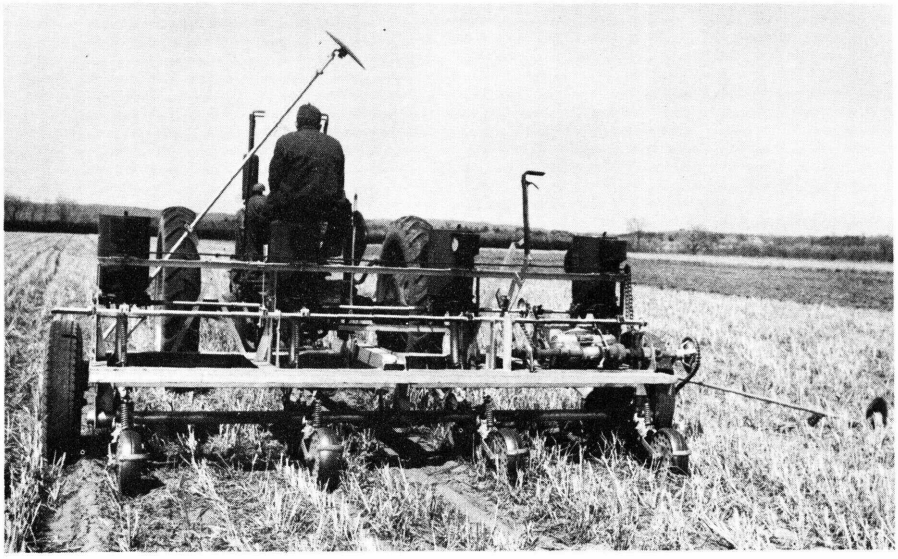
Many farms have planting equipment with suitable seed hoppers. But few of these planters have adequate furrow openers or the packing devices necessary to do a good job of grass seeding. Cotton seed hoppers do a good job of measuring out rough, chaffy grass seed, but they are useless for planting clean seed at low rates (fig. 9). Beet and bean planters have proper furrow openers needed for planting grass, but the seed hoppers will not handle a wide variety of grass seed. You can use many grain drills, with minor modifications, to handle seed of certain grasses, such as the wheatgrasses, but not for chaffy seed.

Satisfactory grass-planting equipment includes:

1. Cotton-planter seed hoppers for rough or chaffy seed and Planet Jr.-type hoppers for clean, small seed, mounted so that seed tubes from both lead directly to the furrow opener.

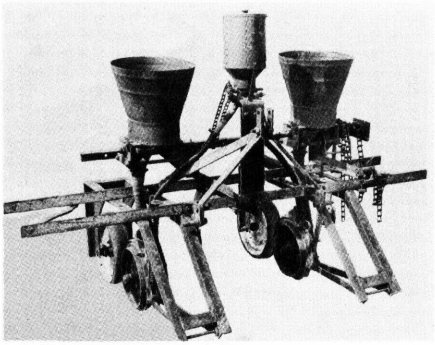
2. Double-coulter disk-furrow openers having depth bands on each disk for placing seed the right depth (fig. 10).

3. A smooth, flat presswheel that follows immediately behind the double-coulter furrow opener with enough weight to close the furrow and leave it firmly packed.



KAN–1764

Figure 9.—**Planting sand bluestem with a special 4-row planter in sudangrass-stubble seedbed. Cotton boxes are used to plant chaffy seed like bluestems, gramas, and indiangrass. Small boxes mounted behind the cotton boxes are used for planting clean seed of such grasses as weeping lovegrass, switchgrass, and blue panic. Disk-furrow openers have depth-control bands and heavy packer wheels follow the openers.**



TEX–49,478

Figure 10.—A special 2-row planting attachment for use with farm tractors with a 3-point hitch. This planter has cotton boxes for planting chaffy grass seed and a box for small seed. It also has double disk-furrow openers and depth bands.

Other planting equipment can often be modified to plant grass seed. If you have special grass drills, you can use them as row planters by placing seed in only the appropriate boxes in the hopper.

Harvesting Grass Seed

Several companies that market seed in the Great Plains have a field representative who "scouts" for native pasture or range areas suitable for harvest. Farmers are often interested in harvesting seed from such areas on their own land or on nearby land. Both must be able to judge whether a field is worth harvesting and to recognize when seed is ready for harvest. Both must be prepared to complete the fieldwork quickly to escape weather hazards and loss of seed through shattering.

If you harvest seed for use on your own farm, often you are justified in harvesting a much lower yielding seed crop than would be profitable for sale. You will need to clean it only enough to permit planting with equipment available to you.

Always carefully examine the stand before harvesting to see if it has set seed and if the percentage of seed fill is

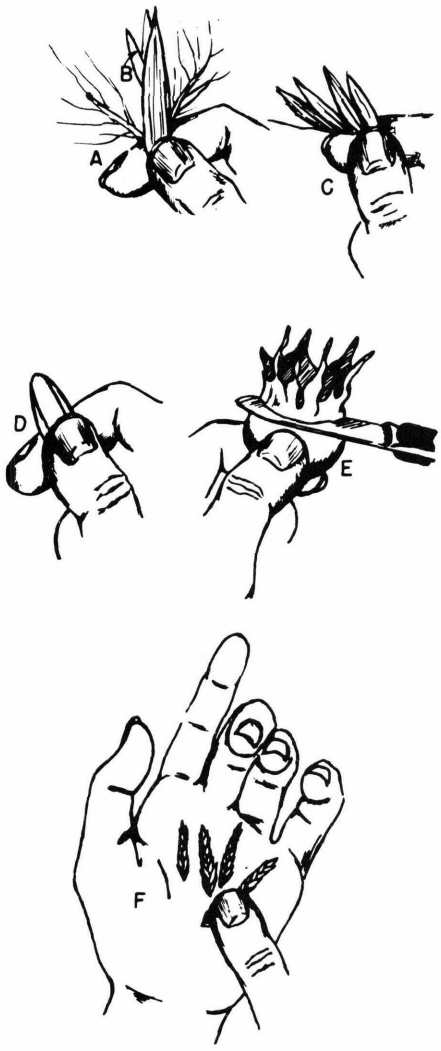


Figure 11.—Some field methods of determining grass-seed fill by: *A* and *B,* Pinching the base of a fertile, sessile spikelet of little bluestem (note grain protruding in *B*); *C*, pinching the base of several spikelets in a single spike of side-oats grama; *D,* pressing across the center of a fertile floret of switchgrass; *E,* cutting across the center of a buffalograss bur with a knife; and *F,* rubbing out spikelets of weeping lovegrass in the palm of hand. All seed units and spikelets are enlarged.

high enough to yield good quality seed (fig. 11). Average fill and purity percentages are given in table 1.

When you are harvesting seed for the commercial market, be sure you have high-quality seed and high yield in the field, enough machines for rapid and efficient harvest, and suitable cleaning machinery to put the seed in market condition.

In judging whether the seed crop of a certain field of grass is worth harvesting, consider: (1) Size and location of the field, (2) its accessibility and nature of the terrain, (3) the capacity and kind of harvesting machinery available, (4) demand for seed, (5) number of seed heads present, (6) percent of fill, and (7) market price of the seed.

No one should attempt to determine the seed-harvest value of any grass crop without wide experience or from careful sampling. Even men with many years of experience in seed harvesting sample the field before starting the harvest. There are no dependable short cuts.

Studies show there is a direct relation between number of seed stalks and yield of seed. As a general guide, a harvestable stand of blue grama has from 25 to 50 seed stalks per square foot. Side-oats grama and western

TABLE 1—*Fill and purity data*

Grass	*Seed fill*		*Seed purity*		*Average germination*	*Length of seed harvest*	*Seeds per pound of pure seed*
	Average	*Minimum for harvest*	*Combine or thresher-run*	*Recleaned fanning mill*			
	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Days*	*Number*
Cool-season grasses:							
Canada wildrye	75	40	65	85	77	15–20	100,000
Green needlegrass	60	40	70	95	60	7–10	180,000
Slender wheatgrass	70	35	70	97	83	10–15	125,000
Western wheatgrass	50	35	55	75	56	10–20	125,000
Crested wheatgrass	55	35	65	80	82	10–15	200,000
Intermediate wheatgrass	60	40	70	89	86	10–15	90,000
Russian wildrye	50	35	65	94	83	1–3	185,000
Smooth brome	70	40	70	87	81	5–10	145,000
Tall fescue	70	40	70	98	83	5–10	230,000
Tall wheatgrass	55	35	70	91	89	10–20	80,000
Warm-season grasses:							
Big bluestem	20	15	24	40	50	10–20	130,000
Blue grama	30	20	30	60	60	10–15	700,000
Buffalograss	90	70	60	88	45	[1] 300	40,000
Indiangrass	60	30	50	80	40	5–10	170,000
Little bluestem	35	20	30	50	50	10–20	250,000
Sand bluestem	30	20	25	50	60	10–20	110,000
Sand lovegrass	60	25	50	95	75	5–20	1,300,000
Side-oats grama	[2] 25	[2] 15	35	70	58	10–15	140,000
Switchgrass	50	40	50	95	50	10–15	275,000
Caucasian bluestem	50	30	30	50	60	5–10	860,000
Turkestan bluestem	50	30	20	50	60	5–10	830,000
Weeping lovegrass	70	40	50	95	82	5–10	1,500,000
Blue panic	60	40	70	95	85	10–20	651,000
Buffelgrass (bur)	80	60	[3]	95	85	[4]	225,000

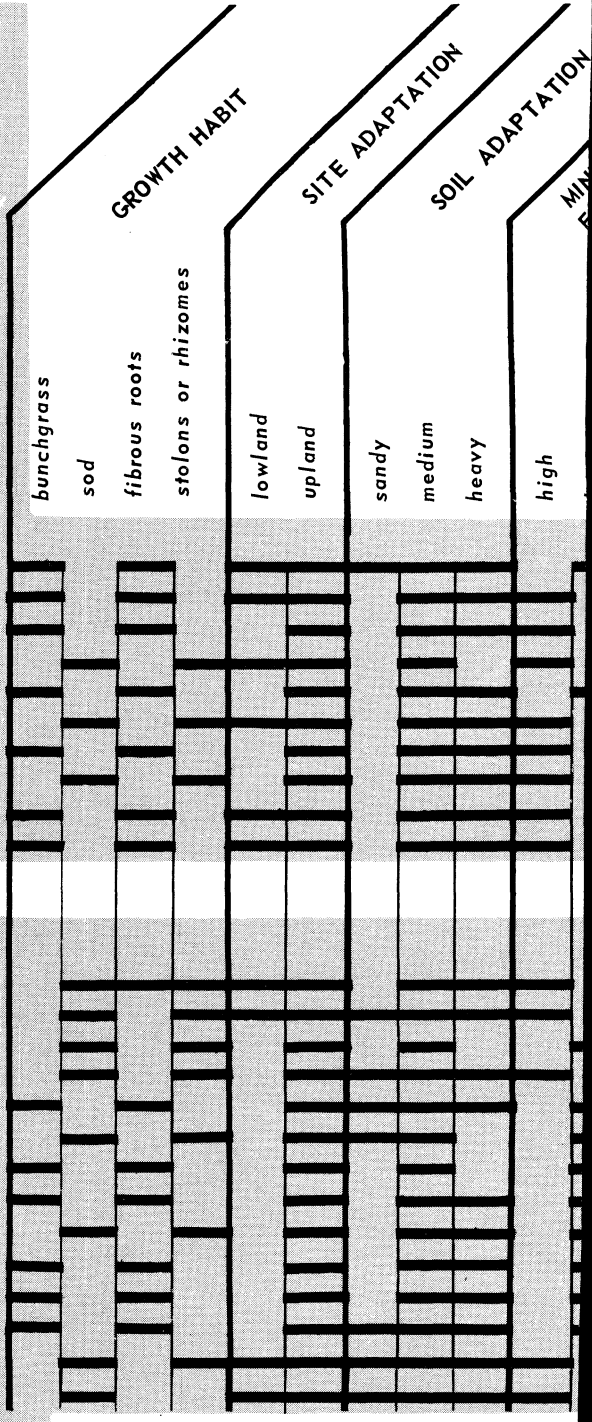
[1] Buffalograss may be harvested with special harvesting equipment any time the ground is not covered with snow.

[2] Determined on individual basis; higher if determined on spike basis.

[3] Harvesting is done by special strippers.

[4] Harvest continues throughout the summer months.

PLANT Characteristics



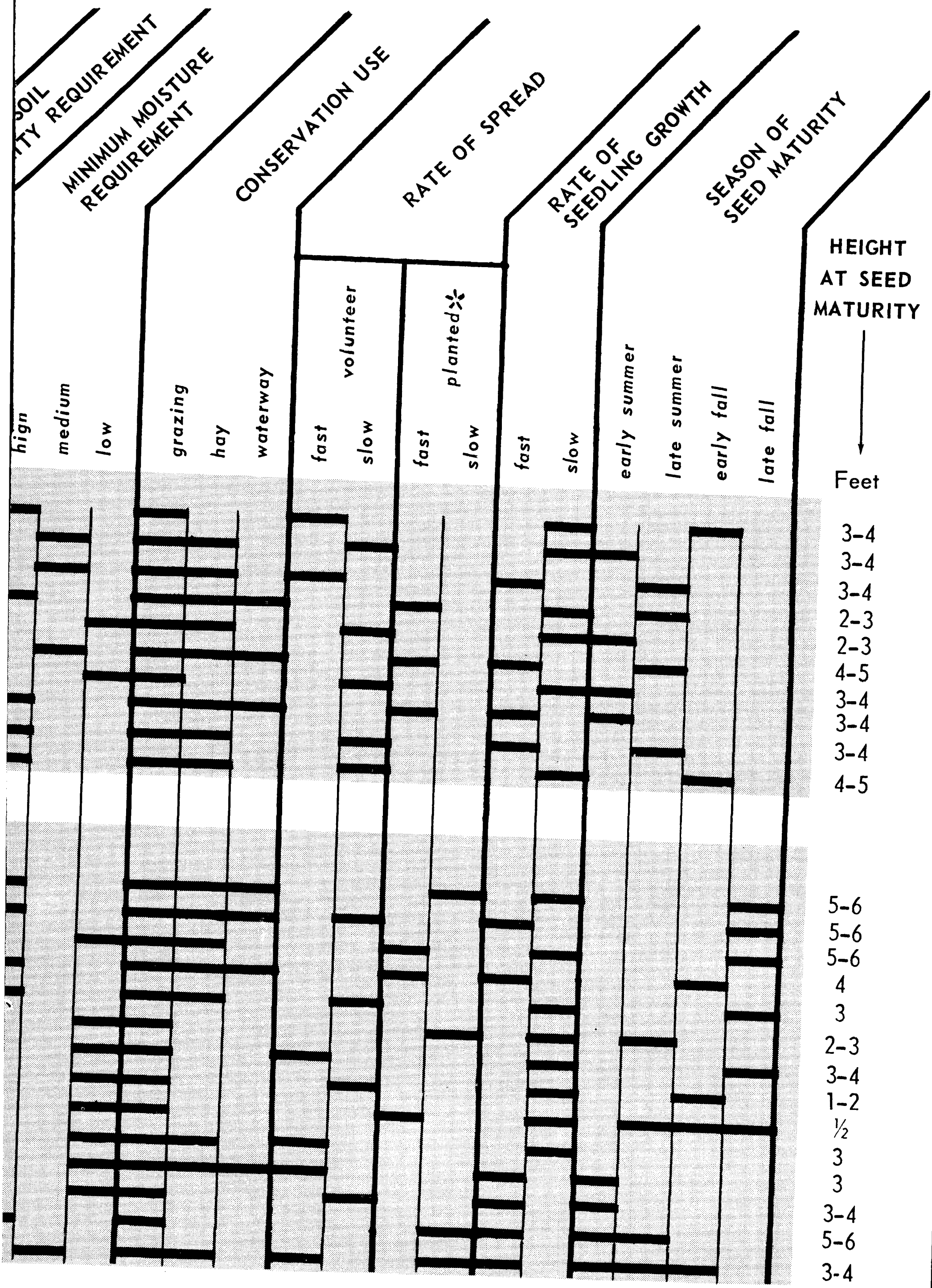
Cool - Season Grasses

Canada wildrye
Green needlegrass
Slender wheatgrass
Western wheatgrass
Crested wheatgrass
Intermediate wheatgrass
Russian wildrye
Smooth brome
Tall fescue
Tall wheatgrass

Warm - Season Grasses

Big bluestem
Indiangrass
Sand bluestem
Switchgrass
Little bluestem
Side - oats grama
Sand lovegrass
Blue grama
Buffalograss
Caucasian bluestem
Turkestan bluestem
Weeping lovegrass
Blue panic
Buffelgrass

* Stolons or rhizomes.


SOIL
...TY REQUIREMENT
MINIMUM MOISTURE
REQUIREMENT
CONSERVATION USE
RATE OF SPREAD
RATE OF
SEEDLING GROWTH
SEASON OF
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HEIGHT
AT SEED
MATURITY
high
medium
low
grazing
hay
waterway
volunteer
planted*
fast
slow
fast
slow
fast
slow
early summer
late summer
early fall
late fall
Feet
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TABLE 2.—*Harvest methods and seed yields*

Grass	Method of harvest			Seed yields per acre [1]	
	Combine	Binder	Stripper	Dry land	Irrigated
				Pounds	Pounds
Cool-season grasses:					
Canada wildrye	x	x	.....	150–200	600–1,000
Green needlegrass	x	#	x	150–400	300–500
Slender wheatgrass	#	x	.....	200–300	300–600
Western wheatgrass	x	.....	.....	100–200	400–500
Crested wheatgrass	x	.....	.....	100–200	200–500
Intermediate wheatgrass	#	x	.....	300–450	400–700
Russian wildrye	x	x	.....	200–300	300–500
Smooth brome	#	x	.....	300–500	400–800
Tall wheatgrass	x	#	.....	100–400	400–800
Tall fescue	#	x	.....	200–400	400–800
Warm-season grasses:					
Big bluestem	#	x	.....	75–200	300–400
Sand bluestem	#	x	.....	60–150	300–450
Indiangrass	#	x	.....	100–300	300–500
Switchgrass	#	x	.....	75–250	400–600
Little bluestem	x	.....	.....	80–150	300–400
Side-oats grama	x	.....	.....	100–300	400–500
Sand lovegrass	x	.....	.....	80–250	400–500
Blue grama	#	.....	x	30–140	300–500
Buffalograss	x	.....	.....	25–100	300–600
Caucasian bluestem	x	.....	.....	50–150	150–200
Turkestan bluestem	x	.....	x	60–150	200–250
Weeping lovegrass	x	.....	.....	100–250	400–600
Blue panic	x	x	.....	75–100	300–400
Buffelgrass	.....	.....	#	75–200	300–500

[1] With favorable rainfall and fertile soil. Severe storms, intense heat during flowering, unfavorable moisture conditions, or inefficient harvesting methods can result in smaller yields than the lowest ones shown here.

#Preferred method.

wheatgrass may have from 20 to 30, while native bluestems, although they vary greatly, may have as few as 10 seed stalks per square foot and yet be worth harvesting.

Abundance of seed heads is a good indicator, but you must examine the heads carefully to find out how many seeds they contain before deciding to harvest. Examine them throughout the field. Place one or two of them in the palm of your hand and rub vigorously with the thumb of your other hand, using a circular motion, to find out if seed is present. If you find seed, then sample the field to see how much is there. Take samples from the poorest as well as the best parts. About every 10 steps, reach down and strip off some seed units from the head and drop them into a bag. Continue this until you have sampled all parts of the field. Then mix the composite sample and carefully examine the individual seed units.

Count out 10 groups of 10 seed units and cut through each one with a knife or pinch the grain out between thumbnail and forefinger. Count both empty and filled seed units and record the number of each. If your records show an average of 4 filled seed units out of 10, the fill is about 40 percent. You can use this counting method for all bluestems and gramas, and for indiangrass. For wheatgrasses, bromes, wildrye, and fescue, sample the field the same way. Since you cannot remove the seed easily from the hulls, press each seed unit with your thumbnail or cut it to tell whether it is filled or empty. In counting side-oats

grama, a filled seed unit is one having at least one grain in the spike or cluster of florets.

You can estimate a crop of buffalograss seed by counting the burs per square foot. For example, if you have an average of 50 burs per square foot, the yield will be about 50 pounds per acre. To sample the seed content of buffalograss burs, mix 8 to 10 burs from each of 50 to 100 widely scattered seed-producing plants. Select 10 burs from the mixed lot and cut each of them crosswise. Many burs contain two or more grains. Provided the total yield is adequate, the seed crop is worth harvesting if 90 or more burs out of 100 contain at least 1 seed each.

Seed set of the lovegrasses can be estimated without stripping the seed because you can see the outline of the grain in the unopened seed hull. Examine stands of these grasses, however, as thoroughly as any others.

Seed units of a switchgrass sample must be rubbed enough to remove the outer glumes. Empty units will then show white and the filled ones dark.

When to Harvest

The time or stage of maturity for harvest varies with the kind of grass and the type of equipment you use. Keep in mind that stages in development of grass seed are milk, soft dough, hard dough, and vitreous, the same as in grain crops. Grass seed harvested in the milk or soft-dough stage shrivels and is low in germination. Harvested in the hard dough or vitreous stage, the seeds are plump, well developed, and more likely to be high in germination.

Start harvesting grasses like lovegrass and needlegrass, which ripen over a long period, when the first seed ripens in the top of the heads. You usually get the most mature seeds a few days after the tips of the seed heads shatter. Experience will help you judge when the most seeds have matured and have not yet shattered. Once seed has matured, you usually have only 5 to 12 days to complete the harvest because the seed shatters rapidly after it reaches maturity.

When you use a binder or windrower you can begin cutting sooner than when you use a combine. Seed cut in the hard-dough stage matures satisfactorily in the shock or windrow, and you reduce danger of excessive loss by shattering.

Harvesting Machines

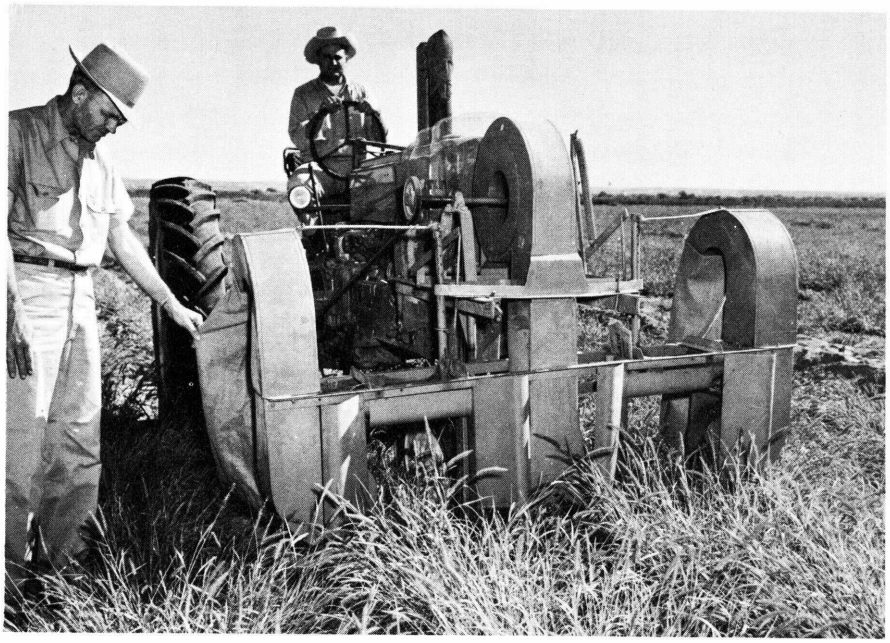
Seed of nearly all of the grasses discussed here can be harvested with ordinary farm machinery (table 2). Most of the machines will need only a few minor adjustments.

Grass seed is sometimes harvested by hand to get seed for testing or for initial seed increase, or when purity is essential. Seed harvest by hand may also be advisable when labor is plentiful and available at a low cost in relation to market value of the seed.

Strippers.—The conventional stripper, often called a "bluegrass stripper" consists of a 2-wheeled frame that supports a box that is open at the front and has a hinged top (fig. 12). It

TEX–46,617A

Figure 12.—Grass-seed stripper showing spiked drum that strips seed from heads and carries it into seedbox. Seed then must be taken out by hand and bagged to be later recleaned.



TEX–48,337

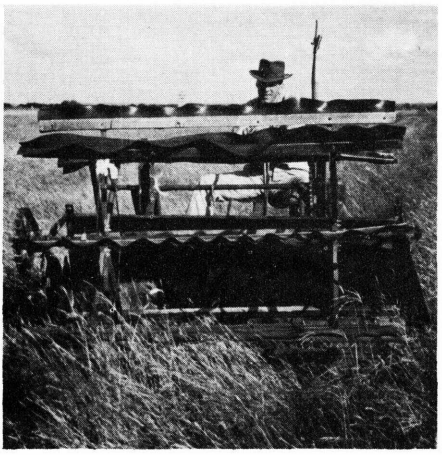
Figure 13.—**Stripper head has two brush reels revolving inward to dislodge seed. Suction fans pick up seed from the brushes and transfer it to cyclone catchers at rear of tractor. Large sacks are suspended from base of cyclone catchers to receive stripped seed material.**

has a spike-studded wooden cylinder mounted in the open front of the box or hopper. This cylinder revolves rapidly forward by a chain and gear arrangement from a ground drive wheel. As the stripper is towed through the grass field, the whirling cylinder whips seed material back into the hopper. When the hopper is ready to empty, the hinged lid is raised. The seed material is removed by hand and then cured and threshed.

Bluegrass strippers available on the market are fast and inexpensive to own and operate and can be used on rough terrain. While they don't get all the seed, they are useful for harvesting grass stands having low potential yields that might otherwise be left unharvested. The bluegrass stripper is best adapted for grasses ranging from about 12 to 24 inches high.

Individual seed growers have made many sorts of special machines to harvest certain grasses (figs. 13, 14, and 15). Most were designed to gather only the ripe seed and leave the rest of the crop undamaged for later harvest. Each does a good job of harvesting the seed crop it was built for. Since they are shop made, none of them is available on the market.

One commercial air-blast stripper used in the southern Great Plains is tractor mounted (fig. 16). Power to the blower fan is furnished by a V-belt drive from the power takeoff. The air blast is discharged at one side of the grass row through the seed heads, blowing the ripe seed off and into a receiving leg on the opposite side. Force of this blast also blows the seed back through the receiving leg into a bag. This machine is inexpensive, can be operated by one man, and, where the grass row is not too dense, is efficient for harvesting light or chaffy seed without damage to the remaining crop. It has no adequate adjustment for height, does not do good work



TEX—46,752

***Figure 14.*—Harvesting King Ranch bluestem seed with a seed-stripper adaptation.**

where grass rows are dense, and is not suitable for harvesting seed in solid stands.

Mower and Windrower.—When used to windrow grass-seed material, the field mower bar is equipped with a commercial swather or curler attachment. This consists of a set of curved bars or metal straps, attached to the sickle bar, that guide cut material into a windrow behind the machine for field curing (fig. 17).

You can convert a standard platform grain binder to a windrower by removing the canvases that normally elevate cut material to the bunching and tying mechanism.

Advantages of windrowing seed material are (1) rapid harvesting, (2) longer harvest period—by cutting before seed reaches full maturity and before there is danger of loss by shattering, and (3) field curing of seed to a safe moisture content for storage before threshing.

Chief disadvantage of windrowing is the chance of seed losses through scattering by wind or through decay or sprouting. Also, with windrowing, you must go over the field twice with machinery.

Seed material harvested by windrowing is usually threshed after curing by a combine equipped with a pickup attachment.

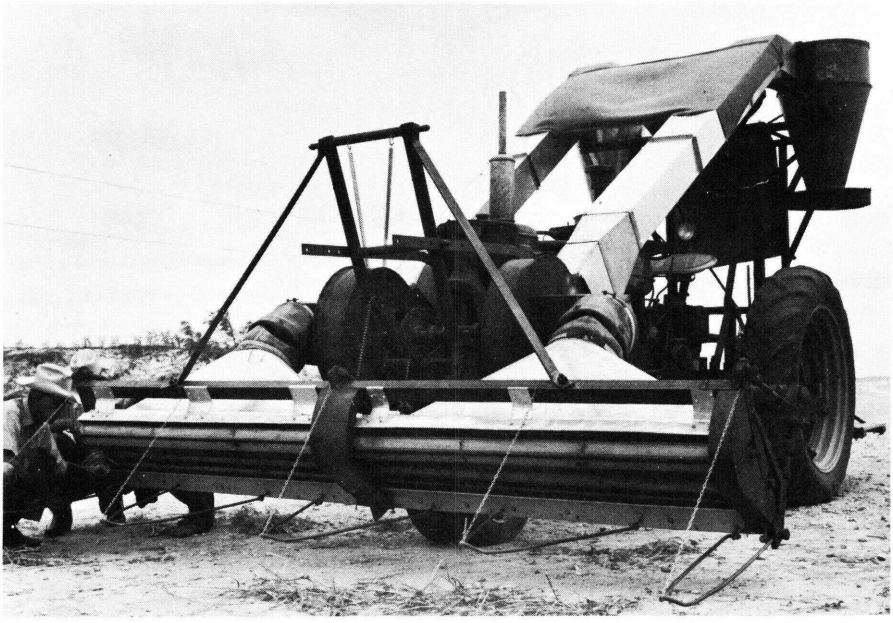
Binder.—The standard platform grain binder is often used in harvesting grasses that grow 30 inches or more high. The binder cuts and binds the material into bundles. After partial curing on the ground, the bundles are either shocked in place or carried to a central location and stacked for later threshing (fig. 18).

The binder sickle bar should have pea guards instead of the regular guards. They lift lodged or drooping stems ahead of the sickle. A pan attached below the juncture of the bed canvas and elevating canvases and another pan between the tying mechanism and the bundle carrier catch seed that shatters while the material is going through the binder. These pans are mounted to slide readily in and out for ease of emptying when full of shattered seed.

The binder is excellent where it can be used because you can cut seed material before the seed is fully mature, and you have less loss by shattering. The seed is field cured for storage before threshing. The main disadvantage of this method is you need more hand labor to care for the crop.

TEX—49,541

***Figure 15.*—Harvesting buffelgrass seed with a specially constructed suction-type harvester.**

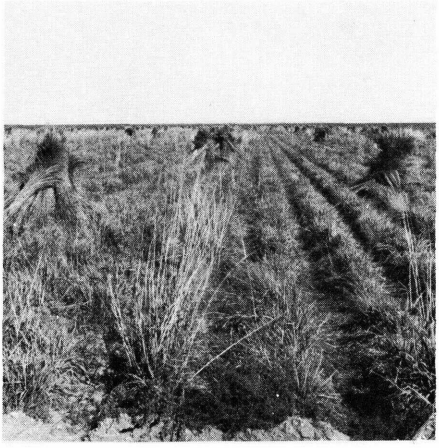


TEX–49,475

Figure 16.—An air blast seed-harvesting machine is used to harvest buffelgrass seed.

TEX–41,364

Figure 17.—Cutting grass seed with a grain binder.



TEX–49,476

Figure 18.—**Indiangrass seed crop bound and shocked ready to be threshed.**

Stationary Thresher.—A stationary thresher is suitable for threshing seed material harvested by any of the machines described here. You can make accurate adjustments in the cylinder-concave setting which determines the degree of threshing, in the air blast which winnows out chaff from seed, and in the settings of the cleaning sieves to give highest quality seed. In these, the thresher is better than a combine when the combine is used for direct field harvest.

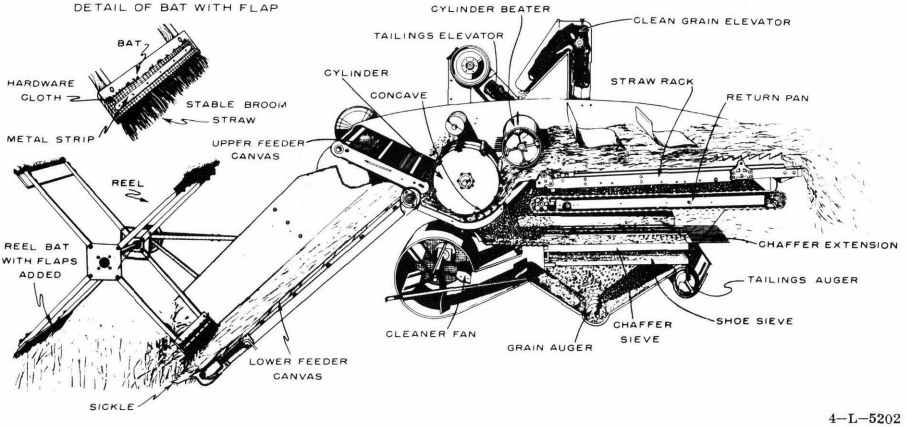
Disadvantages of the stationary thresher are its lack of mobility and the difficulty of cleaning it to avoid contamination.

Combine.—A few simple adjustments of the ordinary farm combine should be made when you use it to harvest grass seed because of the light and often chaffy nature of the seed (fig. 19):

1. When the seed material is short or light in weight, attach belting flaps to the reel bats to sweep the cut material back away from the sickle and onto the header draper. This greatly reduces seed loss when harvesting such grasses as the gramas, bluestems, and certain of the wheatgrasses.

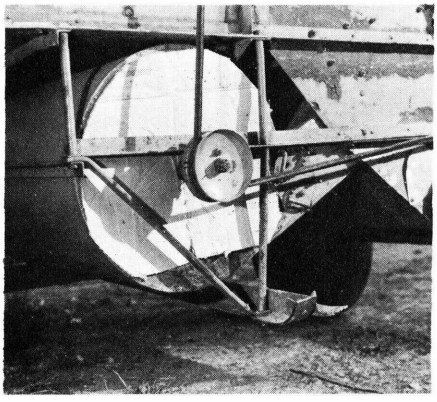
2. Close down or completely shut off the air blast from the fan to the cleaning shoe (fig. 20). If closing the dampers and covering the openings at each end of the fanhousing do not reduce the air blast enough, then remove the fan blades or bypass the fan drive. A very slight air blast helps when threshing some of the wheatgrasses and a few others like switchgrass, but no air is used in threshing most of the grasses.

3. Remove all sieves and chaffers from the cleaning shoe except the upper adjustable chaffer. Open the vanes in this chaffer just wide enough to let threshed seed drop through



4–L–5202

Figure 19.—**Cutaway view showing the units of a small grain combine that are important in making adjustments for harvesting grass seed.**



NEB–1827

Figure 20.—**Air draft must be carefully controlled in combining grass seed. A piece of corrugated cardboard fitted over the intake opening of the fan controls the air blast and prevents light grass seed from blowing out of the combine.**

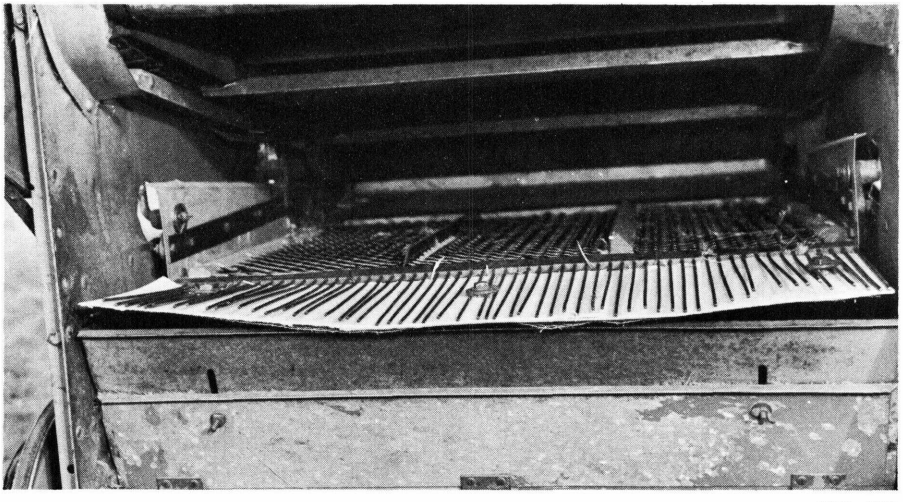
while most of the straw rides on out of the machine.

4. If the cleaning shoe has an adjustable tailer, keep the louvers closed. If there is a tailings rake, cover it with tin or heavy cardboard (fig. 21). This prevents any material from dropping through to the cylinder return auger. In most grasses, you get full threshing when seed material goes through the cylinder the first time. Rethreshing it simply adds more trash to the seed in the bin.

5. Cylinder-concave spacing and cylinder speed:

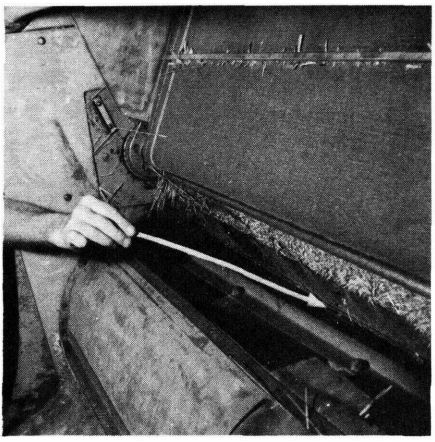
a. For grasses with chaffy seed, such as the bluestems, use the widest cylinder-concave spacing and the slowest cylinder speed that will dislodge all or nearly all of the ripe seed. Close spacing and high cylinder speed break up stems and leaves that go through the machine with the seed. Bluestem and similar grass seed are slow and costly to reclean, so make every effort at this point to keep the seed as free of trash as possible.

b. For grass seed that threshes free of a chaffy covering, such as switchgrass and the lovegrasses set the cylinder-concave spacing close and use a high cylinder speed (figs. 22, 23, and 24). You can easily reclean seed of these grasses in a fanning mill. Therefore, any trash that goes into the bin with the seed is not important so



NEB–1828

Figure 21.—**A piece of sheet metal (looks white in picture) placed under the tailings rake at the rear of the combine sieve keeps stems of grass from falling into return auger and being rethreshed. This helps to reduce the amount of broken stems and leaves in the seed.**



NEB–1829

Figure 22.—**Arrow points to the close adjustment between cylinder and concave bars needed in combining seed from some of the native grasses.**

long as you do a complete job of threshing.

6. Maintain a travel rate in the field that gives an even flow of cut material to the cylinder (no "slugs"), but one that does not overload the chaffer in the cleaning shoe. You will know you are overloading when a lot of good seed comes out over the tailer. Check this flow of threshed material from the separator frequently during each day of harvest.

Combines work most effectively when seed is fully mature. If combining starts too soon, you get immature, low-quality seed. You may also have seed loss from shattering before combine harvests can begin. This hazard is largely offset by the lower cost of combined seed as compared with other harvest methods.

During seed harvesting carefully check the amount and quality of seed you are getting. If you know the amount of seed harvested from a measured area, you can forecast total yield or stop the operation early if yield is too low. This is particularly important near the close of the harvest season when seed loss through shattering is likely to make machine operations unprofitable.

As grass plants become more mature or the straw becomes more brittle, because of frost, seed is more readily removed from the head. You must change the basic cylinder settings of the combine to keep the trash content of the seed material at a minimum—decrease the cylinder speed or increase the cylinder-concave spacing. With careful attention to this throughout the harvest period, you should get seed material of uniform quality.

Table 3 gives suggested combine cylinder speeds and cylinder-concave clearances for each of the principal grasses discussed here. It also gives suggested fanning-mill screen sizes for use in recleaning the seed. These settings are a guide in starting the harvest; they will need some changes in the field. Be sure to keep the lowest cylinder speed at which all good seed are freed from the heads, coupled with the widest cylinder-concave spacing that gives full threshing. Hold chaffer vanes as nearly closed as possible and still permit the seed to fall freely through the openings.

When combines are used in harvesting native grass seed in the field, make sure you have enough machines to

NEB–1830

Figure 23.—**Combining Nebraska 28 switchgrass. This field is fertilized annually and irrigated in fall and spring.**

NEB–1831

Figure 24.—Harvesting switchgrass with combine. Tailings from combine should be inspected frequently to check combine settings.

cover the acreage in the short harvest period (normally 5 to 12 days). Don't plan to harvest more than 6 to 10 acres a day with a 5-foot combine. Consider terrain and density of crop in estimating acreage you can harvest in 1 day.

Pickup Thresher.—Combines are often used to thresh field-cured seed material from windrows or shocks. If threshing from the windrow, replace the sickle bar with a regular pickup attachment that lifts the windrowed material and starts it into the thresher as the combine travels along. Avoid moving the cut material before threshing. Some seed shatters and is lost in feeding the windrow into the combine, but you save lots of labor by threshing this way.

When threshing shocked or stacked

TABLE 3.—*Equipment adjustments for threshing and cleaning grass seed*

Grass	*Combine or thresher*		*Fanning mill*	
	Cylinder speed	*Cylinder-concave clearance*	*Upper screen size*	*Lower screen size (meshes per square inch)*
Cool-season grasses:	*R. p. m.*	*Inches*	*Inches*	*Number*
Canada wildrye	1,100	3/8	5/64 x 1/4	6 x 30
Green needlegrass	1,100	3/8	3/64 x 5/16	6 x 30
Slender wheatgrass	1,500	3/8	4/64 x 1/4	6 x 24
Western wheatgrass	1,500	3/8	5/64 x 1/2	6 x 24
Crested wheatgrass	1,400	3/8	1/18 x 1/4	6 x 30
Intermediate wheatgrass	1,300	1/4	1/14 x 1/2	6 x 24
Russian wildrye	1,000	1/4	5/64 x 1/4	6 x 30
Smooth brome	1,000	3/8	3/64 x 5/16	6 x 30
Tall fescue	1,000	1/2	1/14 x 1/4	4 x 20
Tall wheatgrass	1,500	1/4	12/64	1/16
Warm-season grasses:				
Big bluestem	900	1/2	3/16 x 1/4	1/22
Blue grama	1,200	3/8	1/16	1/25
Buffalograss	1,400	3/8	3/16	1/25
Indiangrass	1,000	3/8	8/64	1/20
Little bluestem	900	1/2	3/22 x 3/16	1/25
Sand bluestem	900	1/2	3/16 x 1/4	1/22
Sand lovegrass	1,500	1/8	1/22	36 x 26
Side-oats grama	1,100	3/8	1/16 x 3/16	1/25
Switchgrass	1,500	1/4	1/16	1/25
Caucasian bluestem	1,000	1/2	12/64	
Turkestan bluestem	1,000	1/2	12/64	
Weeping lovegrass	1,500	1/8	1/24	40 x 40
Blue panic	1,500	1/4	1/16	1/25
Buffelgrass	[1]	[1]	16/64	.....

[1] Not harvested by combine.

material in the field, remove the sickle, move the combine from shock to shock, and feed the bundles into the machine by hand.

Special Adapters.—Many types of machine adapters have been made to improve on regular equipment for harvesting the grasses that produce seed very near the ground or that shatter their seed before all of it matures. Air-suction machines or attachments recover very light seed or pick up seed from the ground. None of these has wide use except some of the combine attachments used for harvesting buffalograss (fig. 25).

The most common adaptation for recovering all the buffalograss seed crop, including burs that shatter or are trampled to the ground, consists of substituting a cylindrical drum with revolving hammers for the combine sickle bar. This drum is carried on slides on the ground ahead of the combine platform or draper. The swinging hammers strip the burs from the plants and pick up most of the ones that have shattered to the ground. The air draft from these hammers carries the seed back under a deflecting hood onto the draper and into the combine cylinder. This attachment is used on both the small 5-foot combines and the larger 12-foot self-propelled machines for most of the commercial collections from native buffalograss sod. Similar adaptations using revolving brushes are used by some commercial harvesters. With them, you can harvest during late fall, winter, and early spring after the normal grazing season. At this time commercial collectors can get harvesting leases much easier and at less cost.

Seed Cleaning

Seed of most grasses should be recleaned after it comes from the combine or thresher. Costs for cleaning vary with the amount and kind of grass seed, the purity desired, and the amount and kinds of material to be removed. These materials include some that are definitely harmful, such as seed of noxious weeds. Chaff, dirt,

TEX—41,729

Figure 25.—Harvesting buffalograss seed with grain combine that has been altered to move sickle close to the ground. Brooms added to the reel bats push grass into sickle and sweep burs onto the feeder canvas. Reel has been moved forward with the sickle.

immature seed, and trash all lower market values and interfere with determining seeding rates and establishing even stands.

In cleaning seed, first remove excess straw. You can do this with a fanning mill having a top screen of the right size, or with a scalper.

Grass-Seed Scalper.—A homemade scalper for cleaning trashy grass-seed material handles large quantities of seed rapidly and prepares it for planting with special grass drills or, in many cases, for sale without further cleaning (fig. 26). The scalper is especially useful in rough cleaning of seeds of bluestems, switchgrass, gramas, and buffalograss.

You can make a grass-seed scalper at relatively low cost. It consists of a frame supporting an inclined screen of hardware cloth that shuttles back and forth through the action of an eccentric drive connected to a small motor. The framework need not be more than 6 feet long. A 30-inch width is convenient for hardware-cloth screens, or a 28- to 36-inch width for certain fanning-mill screens. Make the lower end of the screen frame adjustable to slopes of 6 to 12 inches from horizontal. When you place trashy seed material on the upper end of the screen, the shuttling action of the frame causes the seed to fall through, while the coarse trash passes over the length of the screen. If the coarse material contains much unthreshed good seed, you can salvage the seed by running the material through a thresher or combine. Similar scalping machines are available commercially.

Fanning Mill.—A fanning mill may be used for cleaning most grass seed. If you do the job with care, it gives excellent results. In the fanning mill, screens of different grades of fineness are used for sorting the seed, and an air blast from a fan separates the seed from the trash. By selecting the right screens and repeating the fanning process, you can get nearly any standard of seed purity you want.

Ordinarily 2-screen fanning mills are used to clean seeds of such grasses as lovegrass or switchgrass and processed seeds of other species. Open-

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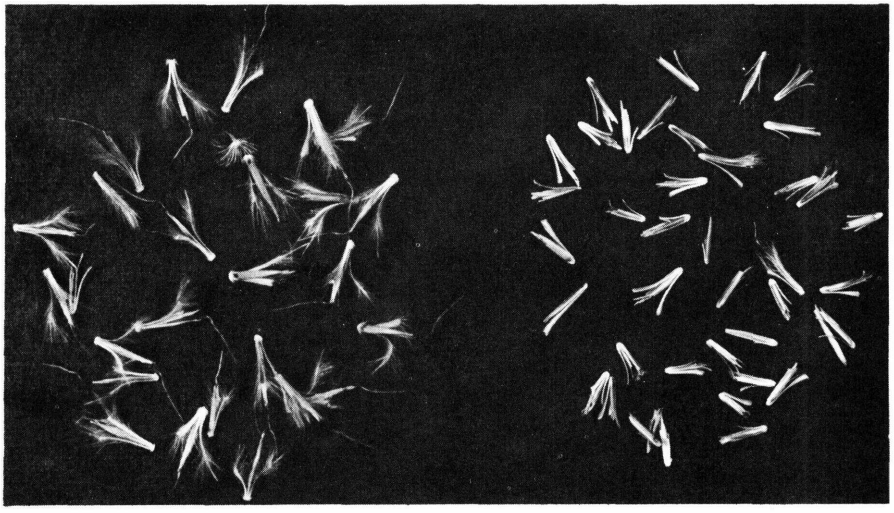
Figure 26.—**A homemade seed scalper such as this one is commonly used for rough cleaning of many grass seeds.**



R7–766

Figure 27.—**Seed of little bluestem before processing (left) and after processing (right). Processing improves seed quality and makes some grass seeds easier to plant.**

ings in the top screen should be just large enough to pass the largest seeds; those in the bottom screen small enough to retain all good small seeds but permit sand and small seeds to pass through.

If a fanning mill is not available locally or if large quantities of seed are to be cleaned, have your seed cleaning done at an elevator or a commercial seed house. The large machines used for commercial cleaning do a faster and more thorough job. Most of them have traveling screen brushes, roll-feed hoppers, air adjustments, variable-pitch screens, and other desirable features.

Seed Processing

It is almost impossible to clean some grass seeds with standard farm machinery. These are the ones that have awns and other appendages that threshing does not ordinarily remove. Removing these appendages by mechanical treatment of the seed is referred to here as seed processing. Seed scarifiers are sometimes used for this, but the best machine for the job is the farm hammer mill. After processing the seed material in a hammer mill, you clean it of dust, broken awns, and other trash in a fanning mill before planting.

For processing, grasses fall into three main groups:

1. Those grasses, such as the lovegrasses, switchgrass, and the dropseeds, that have seeds you can normally free from their coverings by threshing and seldom require processing. The wheatgrasses are also included in this class, although some kinds of wheatgrass seed have pronounced awns that should be removed for easy planting. Wheatgrass seed clusters or "doubles" can be broken apart by light processing.

2. Those grasses, such as the gramas and the bluestems, that have seeds you can prepare for planting either by complete processing, which reduces them to clean grain, or by partial processing, which removes only their undesirable appendages (fig. 27).

3. Those grasses, such as green needlegrass and Canada wildrye, that have seed you cannot conveniently plant in their natural condition except with specially constructed drills and broadcasters. You cannot economi-

cally hull these, but processing readily frees them of their objectionable awns. After processing, you can usually plant them with ordinary farm drills.

For processing the seed of any of these grasses, mills with swinging hammers and those with nonswinging hammers have been used with about equal success. During the milling operation, results depend chiefly on (1) speed of cylinder or rotor, (2) size of screen openings, and (3) rate of feed.

Since farm hammer mills are designed for grinding, you must greatly reduce their normal cylinder speeds when you use them for processing seed. The correct speeds for processing seeds of the grasses considered here range from about 600 to 1,400 revolutions per minute. In general, the greater the length of the seed in proportion to its thickness, the slower the cylinder speed must be to avoid much loss of seed through breakage.

Some hammer-mill screens have slot openings instead of round ones. Thus, the seeds fit the screen openings better, and you get less breakage of long, narrow seeds. When you don't have a screen with just the right size of openings, use a coarser screen and increase the cylinder speed. This gives much the same result as you would get with a finer screen.

Feed the hammer mill to its full capacity. Then the cylinder and hammers roll the material around repeatedly and squeeze out through the screen whatever seeds have been trimmed enough to pass readily. If rate-of-feed drops and cylinder speed stays the same, the cushioning effect of seed on the hammers is reduced, and the hammers begin their normal function of grinding the seed.

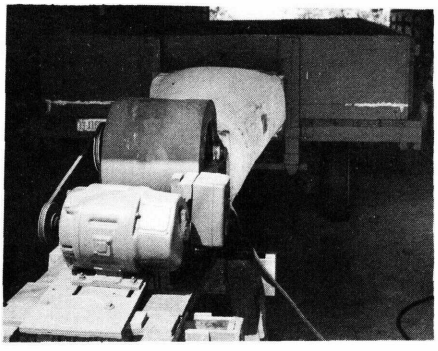
When adjusting the hammer mill—

1. Use a screen with openings slightly larger than the seed to be processed.

2. Start the mill at slow speed. Fill the cylinder with seed material and keep it full.

3. After a short trial run, carefully examine the seed that has passed through the mill. If you find few or no cracked or hulled seeds but many of the seeds still have appendages, advance the cylinder speed about 100 revolutions per minute. *Be very careful to prevent cracking or damaging of seed.* Overprocessing may greatly reduce germination.

4. Repeat step 3 until you get the most trimmed material with the least breakage of seed. Differences in seed size within a given lot often make it necessary to rerun the part still untrimmed through a finer hammer-mill screen.



NEB–1832

Figure 28.—**Drying Nebraska 28 switchgrass with unheated air in a flat-bed farm trailer. Moisture content of seed can be reduced within a few hours so that it can be safely stored.**

You can expect some seed loss in processing grass seed, but if you follow these steps carefully, such loss is negligible. Processed and recleaned grass seed consists of high-quality material which you can depend on to give good stands at lower rates of planting than when you use unprocessed seed.

Seed Testing and Storage

While grass seed is being cleaned, a handful or two of the cleaned seed from each bag should be put into a separate bag. When the cleaning is finished, thoroughly mix the contents of this bag and send a sample of the mix to a seed laboratory for testing. In no other way can you get a true composite sample from a given lot of

chaffy grass seed. The tests determine purity, germination, weed-seed content, inert matter, and presence of other crop seed. The results show the value of your seed, guide you in setting a fair sale price, and enable the user to plant the right amount of seed per acre.

Seed purity and germination averages for grasses considered here are given in table 1. These values, based on large numbers of seed samples, may be used as a guide in buying seed of these grasses or in offering such seed for sale.

Freshly harvested seed of most grasses is more or less dormant and will not germinate well until after storage for 6 months to a year or sometimes longer. Some of the wheatgrasses, green needlegrass, switchgrass, and buffelgrass are especially slow in passing through this period of afterripening dormancy. Others show good germination 6 to 8 months after harvest.

Grass seed must be dry before you place it in bags or bins for storage. If it is damp or some of it is immature, as is often the case with seed obtained by direct combining, spread it out thinly for drying. Sometimes you may need to turn the seed with a fork or scoop once or twice a day during this drying period. There have been some experimental trials with artificial drying of small lots of grass seed. Both control heated and unheated air drafts have been used (fig. 28). Procedures are generally the same as those used for artificial drying of feed grains. Some practical means have been developed for rapid drying of grass seed and are in use in some places (figs. 29 and 30).

When grass seed is dry, store it in a cool, dry room. Most grass seed holds its viability for at least 3 years. Processed grass seed does not retain it as long in storage as nonprocessed seed of the same grass. Local climatic conditions sharply affect the length of time seed will retain viability under bin storage. Laboratory tests show that seed stored under natural conditions in the northern and western part of the Great Plains maintains a high viability much longer than seed

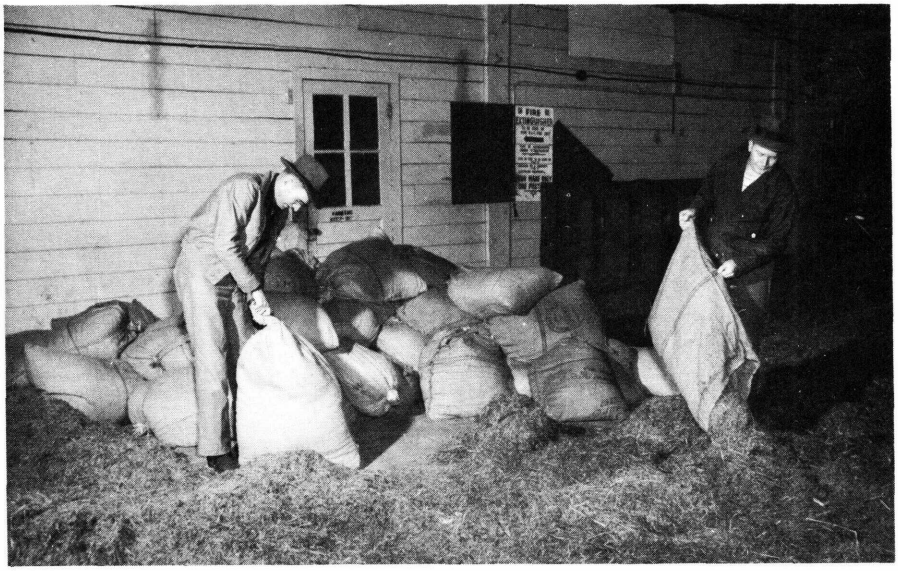


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Figure 29.—Spreading freshly harvested bluestem grass seed to dry—a method commonly used when artificial drying equipment is not available.

TEX–49,542

***Figure* 30.—A heated-air drying system with loosely filled bags of seed laid over holes in the false door of the dryer. An air draft heated to 105° F. is forced through for quick drying of seed.**

stored under natural conditions in the southern or eastern part. For example, big bluestem and little bluestem at Mandan, N. Dak., showed no loss in viable seed until after 8 years in storage. Big bluestem seed from the 1949 crop stored under normal conditions at Manhattan, Kans., lost 72 percent of its viability at the end of 3 years; little bluestem seed from the 1948 crop stored under the same conditions at Manhattan lost 64 percent at the end of 4 years. The rate of loss in viability increases sharply farther south in Oklahoma and Texas.

Where To Get Help

When you begin producing or harvesting grass seed, you are likely to need personal assistance from an experienced technician. Agricultural agencies, such as the Soil Conservation Service and Extension Service, will give you this assistance.

Soil conservation district supervisors arrange for technical assistance to district cooperators in producing and harvesting grass seed. Special planting equipment is available to cooperators in many districts and seed harvesting and cleaning equipment in some.

Agricultural experiment stations, the Soil Conservation Service, and cooperative plant materials centers select and develop strains of grasses needed for local areas, local problems, and general use. After they know how to produce the seed and have enough of the new or improved seed stock, it is distributed to interested growers through crop-improvement associations and soil conservation districts. This is the best known means of rapidly increasing seed of superior grasses for commercial use. As farmers and ranchers learn more about producing and harvesting grass seed, seed of grasses important to the Great Plains will become more readily available, locally and commercially.

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